CLAIMS:

1. A method for generating training data (D_T) for an automatic speech recogniser (2) for operating at a particular first sampling frequency (f_H), comprising the following steps:

- deriving spectral characteristics (S_L) from audio data (D_L) sampled at a second frequency (f_L) lower than the first sampling frequency (f_H);
- extending the bandwidth of the spectral characteristics (S_L) by retrieving bandwidth extending information (I_{BE}) from a codebook (6);
- processing the bandwidth extended spectral characteristics (S_{LE}) to give the required training data (D_T).

2. A method according to claim 1, where the conversion of audio data (D_H, D_L) into sets of spectral characteristics (S_H, S_L) comprises calculating the FFT of the audio data (D_H, D_L) to give a set of Fourier coefficients (31) and filtering the output of the FFT with a filterbank (22) to give a set of filterbank power values (32).

3. A method according to claim 2, where the conversion of audio data (D_H, D_L) into sets of spectral characteristics (S_H, S_L) comprises processing the FFT coefficients (31) or the filterbank power values (32) to give a set of log-spectral coefficients (33).

4. A method according to any of claims 1 to 3, where the processing of bandwidth extended spectral characteristics ($S_{L,E}$) comprises a step of altering the spectrum to adjust signal properties of the audio data (D_L).

5. A method according to claim 4, where the step of altering the spectrum to adjust the signal properties of the audio data (D_L) is performed in the linear domain.

6. A method according to any of claims 1 to 5, where the derivation of the spectral characteristics (S_L) from audio data (D_L) is followed by a step subtracting the mean spectrum from the spectral characteristics (S_L).

7. A method for training an automatic speech recognition system (2) wherein the data (D_T) used for training are at least partially generated using a method according to any of claims 1 to 6.

8. A method for generating a codebook (6) for extending the bandwidth of spectral characteristics (S_L) for audio data (D_L) sampled at a second sampling frequency (f_L) to spectral characteristics (S_H) for a first sampling frequency (f_H) higher than the second sampling frequency (f_L), comprising the following steps for each entry of the codebook (6):

- deriving a first set of spectral characteristics (SC_H) from audio data (DC_H) sampled at the first sampling frequency (f_H);
- performing a sampling rate transformation on the audio data (DC_H) to the second sampling frequency (f_L) and deriving a corresponding second set of spectral characteristics (SC_L);
- generating a codebook entry (12) based on the second set of spectral characteristics (SC_L) and augmenting the codebook entry (12) with additional higher frequency information from the first set of spectral characteristics (SC_H).

9. A method according to claim 8, where augmenting the codebook entry (12) comprises extracting information from the corresponding first set of spectral characteristics (S_H) pertaining to the frequencies above the second sampling frequency (f_L) and attaching this information to the codebook entry (12) in the codebook (6).

10. A method according to claim 8 or 9, where the derivation of the second set of spectral characteristics (SC_L) is followed by a background noise reduction and/or channel normalization step.

11. A method according to claim 10, where the spectral characteristics (SC_L) comprise a log-spectral representation, and the channel normalization is performed by subtracting the mean log spectrum from the log spectral characteristics (SC_L).

12. A method according to claim 10, where the spectral characteristics (SC_L) comprise a linear spectral representation, and the background noise reduction is performed by subtracting a background noise spectrum from the linear spectral characteristics (SC_L).

13. A method according to claim 11 and 12, where the background noise reduction is performed by subtracting a background noise spectrum from a linear spectral characteristics (SC_L) subsequently calculating the logarithm and then subtracting the mean log spectrum from the log spectral characteristics

14. A system (1) for generating training data (D_T) for an automatic speech recogniser (2) operating at a particular first sampling frequency (f_H), comprising:

- a converter (3) for deriving spectral characteristics (S_L) from audio data (D_C) sampled at a second frequency (f_L) lower than the first sampling frequency (f_H);
- a retrieval unit (4) for retrieving bandwidth extending information for the spectral characteristics (S_L) from a codebook (6);
- a processing module (7) for processing the bandwidth-extended spectral characteristics ($S_{L,E}$) to give the required training data (D_T).

15. A system (5) for generating a codebook (6) for extending the bandwidth of a set of spectral characteristics (S_L) for audio data (D_L) sampled at a second sampling frequency (f_L) to a set of spectral characteristics (S_H) for a first sampling frequency (f_H) higher than the second sampling frequency (f_L), comprising:

- a converter (9) for deriving a first set of spectral characteristics (SC_H) from audio data (DC_H) sampled at the first sampling frequency (f_H);

- a module (10) for performing a sampling rate transformation on the audio data (DC_H) to the second sampling frequency(f_L) and for deriving a corresponding second set of spectral characteristics (SC_L) for the second sampling frequency (f_L);
- a codebook entry generator (11) for generating an entry (12) for the codebook (6) based on a second set of spectral characteristics (SC_L) and for augmenting the codebook entry (12) with additional higher frequency information from the corresponding first set of spectral characteristics (SC_H);